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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,103

10/16/2006

John C. Bell

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7590
Legal Department
930 Clopper Road
Gaithersburg, MD 20878

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EXAMINER

MOSHER, MARY

ART UNIT

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1648

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/551,103	Applicant(s) BELL ET AL.	
	Examiner Mary E. Mosher, Ph.D.	Art Unit 1648	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/2/07, 2/25/08.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-20 is/are pending in the application.
- 4a) Of the above claim(s) 16-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-15 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/26/05 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/17/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of group I (claims 1-15 and 20), species ΔM51 in the reply filed on 11/2/07 is acknowledged. The traversal is on the ground(s) that examination of all groups would not involve undue burden. This is not found persuasive because examination of the remaining method claims would require additional search and consideration of additional non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

The requirement is still deemed proper and is therefore made FINAL.

Claims 16-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected group, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 11/2/07.

Specification

The disclosure is objected to because of the following informalities: Figures 6, 7, and 11-16 contain sequence recitations that are not accompanied by the required SEQ ID numbers. Amendment of the Brief Description of the Drawings is suggested. If the sequences are not already included in the Sequence Listing, then a replacement Listing is required. See 37 CFR 1.821-1.825.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 7-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims depend from cancelled claim 1. Also, claim 7 lacks antecedent for "said one or more mutations."

Claim 7 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 7 is drawn to a mutant VSV with a Δ M51 mutation in the matrix protein, and further mutations resulting in a modulation of the interaction of the M protein with mitochondria in a host cell. The specification teaches that residues 1-72 are involved in mitochondrial targeting of the M protein, and that residue 51 is not required. However, there is no working example of a mutant VSV with either increased or decreased mitochondrial targeting. Subsequent work provides evidence that only mutation of residues 66 and 67 modulate targeting, and mutant virus with these alterations could not be recovered (Lichty et al, Journal of Virology 87:3379-3384, 2006). Since the specification provides no guidance on which residues of the M protein could be modified to obtain the claimed mutant virus, and even the inventors were unable to produce such a virus with later experimentation, it is concluded that the specification does not reasonably convey possession of the mutant virus as claimed.

Claim 7 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. As discussed above, claim 7 involves a mutant virus with an M protein mutation that modulates mitochondrial targeting. The specification provides little guidance on making such a mutant, and no working example. Subsequent attempts by the inventors to make such a virus failed, see the last paragraph of Lichty et al. Considering the limited guidance and the unpredictability of success, it is concluded that undue experimentation would be required to enable the mutant virus as claimed.

Claim Objections

Claim 4 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 4 is drawn to a Markush group of mutations which includes species (e.g. V221F) which are outside the scope of parent claim 3. Perhaps the subject matter would be better described in two claims, where one claim further limited claim 3 by specifying the larger deletions encompassing M51, and the other further limited claim 3 by requiring a second mutation at V221F, etc.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3-5, 9-15, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitt et al US2005/0260601. Whitt teaches recombinant rhabdoviruses, specifically VSV, with mutations in the M protein. Whitt also teaches use of the virus as a vector, as a vaccine, and as an oncolytic agent, see for example claims 94-103. Whitt differs from the claimed invention in that Whitt does not specifically teach deletion of the M51 residue. However, Whitt broadly teaches mutation or partial deletion of the M protein, see for example page 2, paragraph 0012, and teaches substitution mutation of residues 51 and 226. It would have been within the ordinary skill of the art to make a partial deletion that removed residue 51, for the purpose of creating a more

reversion-resistant virus, and to incorporate multiple mutations for the same purpose. Therefore the invention as a whole is prima facie obvious, absent unexpected results.

Claims 4-6, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitt et al US2005/0260601 as applied to claim 3 above, and further in view of Desforges et al (Virus Research 76:87-102, 2001, cited in IDS). Claims 4-6 differ from Whitt, in part, by specifying a mutation in residue 221, and claim 8 differs from Whitt in requiring that the virus trigger cytokine production in an infected cell. However, Desforges teaches that V221F and S226R mutations are involved in persistent infection, which would be a valuable characteristic for a vector virus, and also that viruses with these mutations and mutation in M51 all induce interferon in infected cells. Therefore, further modification of Whitt to incorporate these mutations would have been obvious, absent unexpected results.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary E. Mosher, Ph.D. whose telephone number is 571-272-0906. The examiner can normally be reached on varying dates and times; please leave a message.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Campell can be reached on 571-272-0974. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mary E Mosher, Ph.D./
Primary Examiner, Art Unit 1648

5/15/08